UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,018	10/20/2003	Maarten Menzo Wentink	088245-2591	4108

23524 7590 03/22/2011

FOLEY & LARDNER LLP
150 EAST GILMAN STREET
P.O. BOX 1497
MADISON, WI 53701-1497

EXAMINER	
TAYLOR, NICHOLAS R	

ART UNIT	PAPER NUMBER
2441	

MAIL DATE	DELIVERY MODE
03/22/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/689,018
Filing Date: October 20, 2003
Appellant(s): WENTINK, MAARTEN MENZO

Paul S. Hunter
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed January 21st, 2011, appealing from the Office action mailed August 27th, 2010.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The Appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The Appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(**8) Evidence Relied Upon**

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal:

Li et al. (U.S. PGPub 2002/0163929) filed on May 3rd, 2001, and published on November 7th, 2002;

Cali et al. ("IEEE 802.11 Protocol: Design and Performance Evaluation of an Adaptive Backoff Mechanism"), published in September, 2000; and

Singh et al. ("PAMAS – Power Aware Multi-Access Protocol with Signaling for Ad Hoc Networks"), published on July 1st, 1998.

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 4-7, 13, 17, 22, 25, 28, 30, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. (U.S. PGPub 2002/0163929) and Cali et al. (“IEEE 802.11 Protocol: Design and Performance Evaluation of an Adaptive Backoff Mechanism").

3. As per claims 1, 13, and 22, Li teaches a method for accessing a shared resource comprising:

a first station sharing a resource with a plurality of other stations; (Li, see architecture and shared medium of paragraphs 0032, 0033 and fig. 1)

the first station determining a first average backoff interval by measuring an average wait time that the first station incurred during a plurality of previous access attempts to the shared resource; and (Li, see overview of paragraphs 0014-0016, fig. 5, and paragraphs 0059-0064, where the average backoff interval is determined by measuring an average wait time from previous access attempts)

once it is determined that the first station desires access to the shared resource and the shared resource first becomes available, the first station refraining from contending for access to said shared resource for at least an interval substantially equal to the first average backoff interval (Li, see paragraphs 0065-0067, and fig. 6, where the station is prevented from contending for access until an interval equal to the first average backoff interval has passed).

Li teaches the above, including measuring an average wait time that is based on the present collision rate that is determinative of successful network throughput to determine a first backoff interval (see generally paragraph 0014-0016). However, Li is silent as to measuring an average wait time that the first station incurred during a plurality of previous access attempts to the shared resource.

In a similar field of endeavor, Cali teaches an improved method of calculating an average backoff interval value using average wait time (pg. 1774, section 1, description of author's proposal; see also pg. 1776 section B describing calculating the backoff window). The average wait time is determined based on the station's plurality of previous attempts to access the shared resource (see pg. 1778 discussion of observing prior channel access). Further, the average wait time is measured from a time that the station determines the resource has become idle to a time that that a pending frame is transmitted, and calculating an average of the wait times (see pg. 1778, calculation of timing, including basing the calculation on a moving average).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have combined Li and Cali to provide the average backoff

interval calculation of Cali in the system of Li, because doing so would provide a transmission interval that approaches the theoretical capacity limits of the IEEE 802.11 MAC protocol capacity (see Cali, abstract). Further, both systems are directed to determining efficient backoff intervals using algorithms that are based on station channel status information (Li, paragraph 0053; Cali, abstract). One having ordinary skill in the art would look to known systems (e.g., available 802.11 interval calculation algorithms) to combine the system in known ways (software programming, where both systems use standardized 802.11 protocol variables) to yield predictable results (tuned backoff algorithms that provide better throughput yields; see Cali, pg. 1774 introduction).

4. As per claim 2, Li-Cali teaches the system further comprising the first station transmitting a frame to one of the other stations using the shared resource after said first average backoff interval has passed, wherein said shared resource is a shared-communications channel (Li, see architecture and shared medium of paragraphs 0032, 0033 and fig. 1, where frames are transmitted after intervals have passed).

5. As per claim 4, Li-Cali teaches the system further wherein said average backoff interval is further based on a moving average (Cali, see pg. 1778, calculation of timing, including basing the calculation on a moving average).

6. As per claims 5, Li-Cali teaches the system further comprising the first station refraining from contending for access to the shared resource for a second random backoff interval beyond said first determined average backoff interval (Li, see overview of paragraphs 0014-0016, fig. 5, and paragraphs 0059-0064; see also Cali, pgs. 1776 and 1777).

7. As per claim 6, Li-Cali teaches the system further wherein said second random backoff interval assumes a nonzero value only after an unsuccessful attempt to transmit occurs (Li, see overview of paragraphs 0014-0016, fig. 5, and paragraphs 0059-0064; see also Cali, pgs. 1776 and 1777).

8. As per claim 7, Li-Cali teaches the system further wherein said backoff interval is constrained to be at least as long as an IEEE 802.11 distributed interframe space (Cali, see, e.g., pg. 1776 use of DIFS minimum interval).

9. As per claims 17, and 25, Li-Cali teaches the system further wherein said shared resource is a shared-communications channel and wherein said transmitter communicates over the shared-communications channel in accordance with an IEEE 802.11 protocol (Cali, pgs. 1774 and 1775).

10. As per claims 28, 30, and 32, Li-Cali teaches the system further wherein the first station measuring an average wait time comprises: the first station measuring a plurality

of wait times, each wait time measured (i) from a time that the first station first determines that the shared resource has become idle (ii) to a time that the first station actually transmits a pending frame on the shared resource; and calculating an average of the plurality of wait times (Cali, see pg. 1778, calculation of timing, including basing the calculation on a moving average; see also pg. 1776 and 1777).

11. Claims 3, 8-12, 14, 18, 21, 23, 26, 27, 29, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. (U.S. PGPub 2002/0163929) and Cali et al. ("IEEE 802.11 Protocol: Design and Performance Evaluation of an Adaptive Backoff Mechanism"), further in view of Singh et al. ("PAMAS – Power Aware Multi-Access Protocol with Signaling for Ad Hoc Networks").

12. As per claims 3, 14, and 23, Li-Cali teaches the above, yet fails to teach the system further comprising, after the first average backoff interval is determined, the first station powering down a receiver circuit for at least a portion of said first average backoff interval while the first station is refraining from contending for access to the shared resource.

Singh teaches a wireless resource sharing system (Singh, sections 1 and 2) that powers down a station access a shared resource during intervals in which the station refrains from accessing the resource (see section 2.1 describing IEEE 802.11 nodes that power down when refraining from transmission over the shared resource). Singh additionally teaches the use of the 802.11 protocol specification (section 2.1).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have combined Li-Cali and Singh to provide the power saving of Singh in the system of Li-Cali, because doing so would allow the use of a power-saving mode that is beneficial for conserving battery power in mobile stations (see Singh, section 2.1 discussing the importance and need for power conservation in devices when transmission cycles are not taking place; see also Conclusion section). Further, one of ordinary skill in the art looking to create a station with the commonly understood benefit of an extended battery life would look to prior art teachings that facilitate intelligent power conservation. Singh, which discloses a shared resource communication system, provides one such predictable solution in the form of an intelligent component power-down when communication is not necessary or not possible.

13. As per claims 8 and 18, Li teaches a system comprising:

a station and an access point communicating over a shared resource, (Li, see architecture and shared medium of paragraphs 0032, 0033 and fig. 1)

the access point configured to:

determine a first average backoff interval value by measuring an average wait time that the access point incurred during a plurality of previous attempts to access the shared resource; and distribute the first average backoff interval value to the station, (Li, see overview of paragraphs 0014-0016, fig. 5, and paragraphs 0059-0064, where the backoff interval is determined by measuring an average wait time from previous access attempts)

the station configured to:

transmit data over said shared resource; receive the first average backoff interval value from said access point; once it is determined that the station desires access to the shared resource and the shared resource first becomes available, to refrain from contending for access to said shared resource for at least a first average interval substantially equal to said first backoff interval value; and (Li, see paragraphs 0065-0067, and fig. 6, where the station is prevented from contending for access until an interval equal to the first backoff interval has passed)

power down a receiver circuit for at least a portion of said first interval while the station refrains from accessing the shared resource.

Li teaches the above, including measuring an average wait time that is based on the present collision rate that is determinative of successful network throughput to determine a first backoff interval (see generally paragraph 0014-0016). However, Li is silent as to measuring an average wait time that the first station incurred during a plurality of previous access attempts to the shared resource.

In a similar field of endeavor, Cali teaches an improved method of calculating a backoff interval value using average wait time (pg. 1774, section 1, description of author's proposal; see also pg. 1776 section B describing calculating the backoff window). The average wait time is determined based on the station's plurality of previous attempts to access the shared resource (see pg. 1778 discussion of observing prior channel access). Further, the average wait time is measured from a time that the station determines the resource has become idle to a time that that a pending frame is

transmitted, and calculating an average of the wait times (see pg. 1778, calculation of timing, including basing the calculation on a moving average).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have combined Li and Cali to provide the average backoff interval calculation of Cali in the system of Li, because doing so would provide a transmission interval that approaches the theoretical capacity limits of the IEEE 802.11 MAC protocol capacity (see Cali, abstract). Further, both systems are directed to determining efficient backoff intervals using algorithms that are based on station channel status information (Li, paragraph 0053; Cali, abstract). One having ordinary skill in the art would look to known systems (e.g., available 802.11 interval calculation algorithms) to combine the system in known ways (software programming, where both systems use the standardized 802.11 protocol variables) to yield predictable results (tuned backoff algorithms that provide better throughput yields; see Cali, pg. 1774 introduction).

Li further fails to teach wherein the system powers down a receiver circuit for at least a portion of said first interval while the station refrains from accessing the shared resource.

Singh teaches a wireless resource sharing system (Singh, sections 1 and 2) that powers down a station access a shared resource during intervals in which the station refrains from accessing the resource (see section 2.1 describing IEEE 802.11 nodes that power down when refraining from transmission over the shared resource). Singh additionally teaches the use of the 802.11 protocol specification (section 2.1).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have combined Li-Cali and Singh to provide the power saving of Singh in the system of Li-Cali, because doing so would allow the use of a power-saving mode that is beneficial for conserving battery power in mobile stations (see Singh, section 2.1 discussing the importance and need for power conservation in devices when transmission cycles are not taking place; see also Conclusion section). Further, one of ordinary skill in the art looking to create a station with the commonly understood benefit of an extended battery life would look to prior art teachings that facilitate intelligent power conservation. Singh, which discloses a shared resource communication system, provides one such predictable solution in the form of an intelligent component power-down when communication is not necessary or not possible.

14. As per claim 9, Li-Cali-Singh teaches the system further comprising the first station transmitting a frame to one of the other stations using the shared resource after said first average backoff interval has passed, wherein said shared resource is a shared-communications channel (Li, see architecture and shared medium of paragraphs 0032, 0033 and fig. 1, where frames are transmitted after intervals have passed).

15. As per claim 10, Li-Cali-Singh teaches the system further wherein said first average backoff interval is further based on a moving average (Cali, see pg. 1778, calculation of timing, including basing the calculation on a moving average).

16. As per claims 11 and 21, Li-Cali-Singh teaches the system further wherein the station refrains from contending for access to the shared resource for a second random backoff interval beyond said first average backoff interval (Li, see overview of paragraphs 0014-0016, fig. 5, and paragraphs 0059-0064; see also Cali, pgs. 1776 and 1777).

17. As per claim 12, Li-Cali-Singh teaches the system further wherein said second random backoff interval assumes a nonzero value only after an unsuccessful attempt to transmit occurs (Li, see overview of paragraphs 0014-0016, fig. 5, and paragraphs 0059-0064; see also Cali, pgs. 1776 and 1777).

18. As per claims 26 and 27, Li-Cali-Singh teaches the system further comprising the first station powering down a transmitter circuit for at least the same portion of the first average backoff interval (Singh, see section 2.1 describing IEEE 802.11 nodes that power down when refraining from accessing the resource).

19. As per claims 29 and 31, Li-Cali-Singh teaches the system further wherein measuring an average wait time comprises: the access point being configured to measure a plurality of wait times, each wait time measured (i) from a time that the access point first determines that the shared resource has become idle (ii) to a time that the access point actually transmits a pending frame on the shared resource; and the

access point being configured to calculate an average of the plurality of wait times (Cali, see pg. 1778, calculation of timing, including basing the calculation on a moving average; see also pg. 1776 and 1777).

(10) Response to Argument

In the Argument, Appellant argued in substance that

(**A**) The prior art of Li and Cali does not teach "determining a first average backoff interval by measuring an average wait time that the first station incurred during a plurality of previous access attempts to the shared resource" and "refraining from contending for access to the shared resource for at least an interval substantially equal to the first average backoff interval." The back-off window of Li is instead calculated based on the collision rate or is adjusted to maintain a constant collision rate. Further, the "throughput" in Li represents successful transmissions and does not reflect wait time incurred.

As to point (**A**), Li teaches determining a first average backoff interval by measuring an average wait time that one of said plurality of stations incurs (see overview of paragraphs 0014-0016, fig. 5, and paragraphs 0059-0064, where the backoff interval is determined by measuring an average wait time before successful receipt of data).

The claim language describes measuring an "average wait time" that the first station incurs. A broadest reasonable interpretation of the claim term "average wait time" would include a measurement of network throughput, as the successful transmission ratio of the network would determine the amount of time that a station

would wait for access. That is, the “wait time” that a station incurs would include retransmissions due to lost packets and the collision rate of the network. The wait time is an "average" because it is the sum of multiple previous attempts defining a rate (see paragraphs 0062-0064 describing a portion of the calculation process). The average wait time is used to calculate an average backoff interval (see overview in paragraphs 0014-0016, where an average window is sent to all stations to adjust the system’s collision rate, and consequently the average wait time that each station is incurring).

However, as stated in the Final Office Action dated August 27th, 2010, Li teaches measuring an average wait time that first station incurs but not specifically during a plurality of previous access attempts to a shared resource, because Li instead draws on a broader range of average wait times in calculating a first average backoff interval (i.e., throughput) rather than the first station’s attempts to access a shared resource.

In a similar field of endeavor, Cali teaches an improved method of calculating an average backoff interval value using average wait time (pg. 1774, section 1, description of author's proposal; see also pg. 1776 section B describing calculating the backoff window). The average wait time is determined based on the station's plurality of previous attempts to access the shared resource (see pg. 1778 discussion of observing prior channel access, e.g., the transmission interval monitoring completed by each station). The average wait time is measured from a time that the station determines the resource has become idle to a time that that a pending frame is transmitted, and includes calculating an average of the wait times (see pg. 1778, calculation of timing, including basing the calculation on a moving average).

(**B**) The backoff interval of Li does not read on the claimed backoff interval, as the claimed “interval” is a period in which the station refrains from contending for access to the shared resource. Li teaches re-transmitting during the interval, so the interval can not read on the claimed term. The “backoff interval” is defined in Li at paragraph 0011 as an interval where a transmitting user re-transmits k slots later. Additionally, the terms window and interval cannot be used interchangeably as they are directed to distinct medium access attributes.

As to point (**B**), the claim language describes a "backoff interval" that is used by a first station to refrain from contending for access for at least an interval “substantially equal” to the first average backoff interval. Stated alternatively, the claimed first station must wait for a period of time that is near the determined average backoff interval. Consequently, transmitting during the interval or even after the interval would satisfy refraining for a period of time that is at least “substantially equal” to the claimed duration.

Li teaches a backoff interval during which the station receives a back-off interval and then starts to refrain from contending for access (paragraph 0065 and step 300 & 302 of fig. 6 where the station begins to wait after receiving the back-off window). The station continues to wait until selecting a reservation slot (i.e. contending for access) based on the received interval (paragraph 0065). For example, if the back-off window is one, the station waits for the exact amount of time as the received backoff interval (see

paragraph 0065 and path 308, 310, 316 of fig. 6, where the reservation counter shown as an example to “4” in fig. 6 step 310 is assumed to not interfere; see also paragraph 0057 where the backoff interval is initially set as one). If the back-off window is a higher value, the station may wait for a time less than the backoff interval. However, in any case the station will refrain for a period of time that is at least an interval "substantially equal" to the first average backoff interval.

As to the argument that Li defines the backoff interval in paragraph 0011, it is respectfully submitted that the paragraph describes the function of the binary exponential back-off (BEB) algorithm. Li teaches a new fixed collision rate (FCR) algorithm that is explicitly stated as not the same as the BEB algorithm (see paragraphs 0038 and 0039).

As to the argument that the use of the term “window” (as taught by Li) is inappropriate to apply to the claimed term "interval," it is submitted that a broadest reasonable interpretation of the terms would both conclude with a defined period of time. The argument that the terms define distinct medium access attributes does not rely on any language present in the instant claim language.

(**C**) The Examiner includes a contradiction in the August 27th, 2010, Office Action, therefore the rejection is improper. On pages 5-6, Li is noted as teaching a first backoff interval by measuring an average wait time that the first station incurred yet later notes that Li is silent as to this feature.

As to point (**C**), the complete above cited portion of the office action is as follows:

> Li teaches the above, including measuring an average wait time that is based on the present collision rate that is determinative of successful network throughput to determine a first backoff interval (see generally paragraph 0014-0016). However, Li is silent as to measuring an average wait time that the first station incurred during a plurality of previous access attempts to the shared resource.

Thus, as stated in above the Final Office Action dated August 27th, 2010, Li teaches measuring an average wait time that first station incurs but not specifically during a plurality of previous access attempts to a shared resource, because Li instead draws on a broader range of average wait times in calculating a first average backoff interval (e.g., throughput) rather than the first station's attempts to access a shared resource. Cali cures this deficiency. The Examiner respectfully submits that there is nothing contradictory in that Li teaches a first feature while not teaching a second.

(**D**) The prior art of Li and Cali are not obvious to combine, as the references teach away from any reasonable combination in that a hypothetical combined system of the two references would not produce a functional system.

As to point (**D**), it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have combined the references of Li and Cali to provide the average backoff interval calculation of Cali in the system of Li, because doing so would provide a transmission interval that approaches the theoretical capacity limits of the IEEE 802.11 MAC protocol capacity (see Cali, abstract). Both systems are directed to determining efficient backoff intervals using algorithms that are based on

station channel status information (Li, paragraph 0053; Cali, abstract). One having ordinary skill in the art would look to known systems in a similar field of endeavor (e.g., available 802.11 interval calculation algorithms) to combine the system in known ways (software programming, where both systems currently use standardized 802.11 protocol variables) to yield predictable results (i.e. tuned backoff algorithms that provide better throughput yields; see Cali, pg. 1774 introduction).

(**E**) The Final Office Action dated August 27th, 2010, violates § 707.07(f) of the MPEP. The response is "merely a near-verbatim parroting" of the reasons presented in an earlier office action. The MPEP requires that a response must "answer the substance" of an applicant's argument. The argument is submitted on pages 23, 24, and 28 of the appeal brief.

As to point (**E**), the Examiner foremost submits that the argument as to a proper final rejection under § 707.07(f) of the MPEP is not presented in Appellant's Grounds of Rejection for review. Further, the argument takes issue with a matter concerning the procedural form of an outstanding Final Office Action's response to arguments section. MPEP § 706.07 states the following:

> On the second or any subsequent examination or consideration by the examiner the rejection or other action may be made final, whereupon applicant's…reply is limited to appeal in the case of rejection of any claim (§41.31 of this title), or to amendment as specified in § 1.114 or § 1.116. Petition may be taken to the Director in the case of objections or requirements not involved in the rejection of any claim (§ 1.181).

The Examiner respectfully submits, without conceding to the presented argument, that the subject addresses such requirements (i.e., the sufficiency of a provided response presented in an earlier Final Office Action) and are not germane to the present appeal.

(**F**) The prior art of Li and Cali are not obvious to combine with Singh et al., as the references teach away from any reasonable combination. Modifying a combination of Li and Cali with the teaching of Singh would produce a non-functioning system.

As to point (**F**), the appropriateness of the combination of Li and Cali is addressed in point (D) above.

Singh teaches a wireless resource sharing system (Singh, sections 1 and 2) that powers down a station access a shared resource during intervals in which the station refrains from accessing the resource (see section 2.1 describing IEEE 802.11 nodes that power down when refraining from transmission over the shared resource). Singh additionally teaches the use of the 802.11 protocol specification (section 2.1).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have combined Li-Cali and Singh to provide the power saving of Singh in the system of Li-Cali, because doing so would allow the use of a power-saving mode that is beneficial for conserving battery power in mobile stations (see Singh, section 2.1 discussing the importance and need for power conservation in devices when transmission cycles are not taking place; see also Conclusion section). Further, one of

ordinary skill in the art looking to create a station with the commonly understood benefit of an extended battery life would look to prior art teachings that facilitate intelligent power conservation. Singh, which discloses a shared resource communication system, provides one such predictable solution in the form of an intelligent component power-down when communication is not necessary or not possible.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this Examiner's answer.

Respectfully submitted,

/N. T./

Examiner, Art Unit 2441

/Larry Donaghue/

Primary Examiner, Art Unit 2454

Conferees:

/Larry Donaghue/
Primary Examiner, Art Unit 2454

/Karen C Tang/
Primary Examiner, Art Unit 2447